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Xintian E. Lin

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BLAKELY SOKOLOFF TAYLOR & ZAFMAN LLP

1279 OAKMEAD PARKWAY

SUNNYVALE, CA 94085-4040

EXAMINER

NGO, NGUYEN HOANG

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

DETAILED ACTION

Response to Amendment

This communication is in response to the amendment of 3/10/2008. All changes made to the Claims have been entered. Accordingly, Claims 1-9, and 26-27 are currently pending in the application.

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the antennas at the access point (in which M (M spatial channels) is a constant less than or equal to a number of antennas at the access point) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an

application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3 and 7-9 and 26-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Alastalo et al. (US 2001/0047424), hereinafter referred to as Alastalo.

Regarding claim 1, Alastalo discloses a device, comprising: a scheduler (access point scheduler for performing various timing operations, page 2 [0021]) in an access point to provide a schedule of variable length packets based on transmission times to send on spatial channels to mobile stations (access points broadcasts general information on the current frame, e.g. on uplink and downlink time slots assigned for terminals MT1-MT4, page 2 [0021]-[0022] and page 3 [0030] and abstract).

Alastalo however fails to specifically disclose the amended limitation of filling M spatial channels for traffic for traffic on M stations at a time instant, where M is a

constant less than or equal to a number of antennas at the access point. Alastalo however discloses that as the access point applies SDMA for example to M different terminals, the spatial signatures of the terminals are modified (page 3 [0030]) and that the access point uses a number of antenna elements, N (page 3 [0025] and page 1[0025]). Applicant further submits (see specification, page 4 lines 5-10) that conventional SDMA systems have the access point fill the M channels only using packets buffered for M stations (filling M spatial channels for traffic on M stations at a time instant). It would have therefore been obvious that Alastalo uses such a conventional SDMA system to fill M spatial channels for traffic on M stations at a time instant, since this technique is obviously well known in the art. Raghothaman further discloses that for a system utilizing antennas, the MIMO channel may be considered as a number of C independent channels, where C is less than or equal to the number of antennas and that each of the C channels is also referred to as a spatial subchannel (C corresponding to M spatial channels) of the overall MIMO channel (where M is a constant less than or equal to a number of antennas at the access point, page 1 [0003]). It would have thus been obvious to a person skilled in the art at the time the invention was made to incorporate the concept of having M be a constant less than or equal to a number of antennas at the access point as disclosed by Raghothamam, into method for arranging communication between terminals and an access point as disclosed by Alastalo, in order to efficiently and correctly arrange communications between an access point an a number of mobile stations.

Regarding claim 2, Alastalo discloses the device of claim 1 further including adaptive antenna arrays used in conjunction with a beam forming algorithm to achieve spatial diversity and implement Spatial-Division Multiple-Access (SDMA), wherein the adaptive antenna array changes beam weights based on the schedule (access point applies SDMA for simultaneous transmission to M different terminals, page 1 [0002] and page 3 [0030]-[0036]).

Regarding claim 3, Alastalo discloses the device of claim 1 wherein the scheduler in the downlink provides the schedule of transmission intervals for different mobile stations (M different terminals, page 3 [0030] and abstract).

Regarding claim 7, 8, Alastalo discloses the device of claim 1 wherein the access point sends multiple schedules in a protected time interval to the mobile stations (method for arranging communication between terminals and an access point in a communication system applying data transmission frames which comprises downlink time slots for performing data transmission from the AP to the terminals, page 7 [0061]-[0062] and page 8 claim 1).

Regarding claim 9, Alastalo discloses the device of claim 1 wherein the access point fills spatial channels using the data packets buffered for all the mobile stations (transmission data buffers, page 7 [0060]).

Regarding claim 26, Alastalo discloses a method for a Medium Access Control (MAC) protocol (MAC frame, page 2 [0012]), comprising: scheduling variable length packets in an access point based on transmission times to send on spatial channels to mobile stations (access points broadcasts general information on the current frame, e.g. on uplink and downlink time slots assigned for terminals MT1-MT4, page 2 [0021]-[0022] and page 3 [0030] and abstract).

Alastalo however fails to specifically disclose the amended limitation of filling M spatial channels for traffic for traffic on M stations at a time instant, where M is a constant less than or equal to a number of antennas at the access point. Alastalo however discloses that as the access point applies SDMA for example to M different terminals, the spatial signatures of the terminals are modified (page 3 [0030]) and that the access point uses a number of antenna elements, N (page 3 [0025] and page 1[0025]). Applicant further submits (see specification, page 4 lines 5-10) that conventional SDMA systems have the access point fill the M channels only using packets buffered for M stations (filling M spatial channels for traffic on M stations at a time instant). It would have therefore been obvious that Alastalo uses such a conventional SDMA system to fill M spatial channels for traffic on M stations at a time instant, since this technique is obviously well known in the art. Raghothaman further discloses that for a system utilizing antennas, the MIMO channel may be considered as a number of C independent channels, where C is less than or equal to the number of

antennas and that each of the C channels is also referred to as a spatial subchannel (C corresponding to M spatial channels) of the overall MIMO channel (where M is a constant less than or equal to a number of antennas at the access point, page 1 [0003]). It would have thus been obvious to a person skilled in the art at the time the invention was made to incorporate the concept of having M be a constant less than or equal to a number of antennas at the access point as disclosed by Raghothamam, into method for arranging communication between terminals and an access point as disclosed by Alastalo, in order to efficiently and correctly arrange communications between an access point and a number of mobile stations.

Regarding claim 27, Alastalo discloses the method of claim 26, further including: retrieving antenna resources in the access point to form spatial channels developed on the fly for a waiting mobile station (access point applies SDMA, page 3 [0030]-[0036]).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alastalo et al. (US 2001/0047424), hereinafter referred to as Alastalo.

Regarding claim 4, 5, and 6, Alastalo fails to specifically disclose wherein the schedule accounts for traffic information to the mobile stations based on packet size/queue size/and priority. However it is well known in the art to base transmission schedules on such traffic information as packet size/queue size/and priority. It would have thus been obvious to have the schedule account for traffic information as mentioned above in order to efficiently and correctly transmit data from an access point to a terminal.

Conclusion

2. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NGUYEN NGO whose telephone number is (571)272-8398. The examiner can normally be reached on Monday-Friday 7am - 3:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Firmin Backer can be reached on (571)272-6703. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Nguyen Ngo

United States Patent & Trademark Office
Patent Examiner AU 2614
(571) 272-8398

/N. N./

Examiner, Art Unit 2416

/FIRMIN BACKER/

Supervisory Patent Examiner, Art Unit 2416